

EXHIBIT 21

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12 UNITED STATES DISTRICT COURT
13 NORTHERN DISTRICT OF CALIFORNIA
14 SAN FRANCISCO DIVISION

15 ORACLE AMERICA, INC.,
16 Plaintiffs,
17 v.
18 GOOGLE INC.,
19 Defendant.

Case No. CV 10-03561 WHA

**DEFENDANT GOOGLE INC.'S FIRST
SUPPLEMENTAL RESPONSES AND
OBJECTIONS TO PLAINTIFF'S
INTERROGATORIES, SET 6 (NOS. 38-44)**

Dept. Courtroom 8, 19th Fl.
Judge: Hon. William Alsup

HIGHLY CONFIDENTIAL – ATTORNEYS’ EYES ONLY**INTERROGATORY NO. 39:**

Identify all commercially acceptable, non-infringing substitutes to all or any of the 37 JAVA API PACKAGES used in ANDROID, all reasons for YOUR conclusion that such substitutes are commercially acceptable and non-infringing, and all reasons YOU did not use such substitutes in ANDROID.

FIRST SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 39:

In addition to its General Objections, Google objects to this Interrogatory as prematurely seeking information that is the subject of expert opinion testimony and discovery prior to the dates set by the Court in this matter. Google further objects to this Interrogatory to the extent it seeks information protected by the attorney-client privilege, the work product doctrine, and/or any other applicable privilege, immunity, or protection. Google further objects to this Interrogatory as vague, ambiguous and potentially overbroad and unduly burdensome and not proportional to the needs of the case as to the terms “commercially acceptable,” “substitutes,” “37 Java API Packages,” and “Android.” Google further objects to this Interrogatory as overly broad, unduly burdensome, not relevant to any claim or defense in this lawsuit, and not proportional to the needs of the case to the extent that it seeks information related to operations of Google outside of the United States having no connection with the United States, and to the extent that it seeks information unrelated to the copyright infringement allegations set forth in Plaintiff’s Amended and Supplemental Complaints. Google further objects to this Interrogatory as improperly compound and containing multiple distinct sub-parts. Google further objects to this Interrogatory as prematurely seeking expert opinion testimony prior to the date set by the Court in this matter. Google further objects to this Interrogatory to the extent it attempts to reopen discovery on issues, events, transactions, and/or occurrences that could have, and should have been addressed, if at all, prior to the original trial.

Subject to and without waiving the foregoing objections and the General Objections, Google states that, at the time that Android was released in or around 2007 and thereafter, other possible approaches existed in regard to the development of Android, including but not limited to the use of other programming languages in lieu of the Java programming language in connection

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1 with certain Android core libraries. As such, if Google used a programming language other than
2 Java, Android could have been offered without incorporation of the SSO of the 37 Java API
3 Packages (and certain of the method headers reflecting that SSO) at issue in this lawsuit (hereafter
4 collectively the “SSO”).

5 Google’s use of the SSO in Android was and continues to be an entirely legal and fair use,
6 i.e., a non-infringing use, as discussed more fully in Google’s responses and supplemental
7 responses to Interrogatory Nos. 11, 15, 20, 34, and 37 (all incorporated herein). And, as
8 discussed more fully in Google’s responses and supplemental responses to Interrogatory Nos. 10,
9 12 and 30 (all incorporated herein), Oracle/Sun repeatedly, over the course of years, publicly
10 applauded and commended Google’s release of Android and its use of the SSO. In fact,
11 Oracle/Sun viewed Android as “strapping rockets” on Java and advancing the Java community of
12 which Oracle/Sun was a part. It was only after Oracle acquired Sun and failed to successfully
13 build its own smartphone or smartphone platform that Oracle (years after Android’s release)
14 reversed its position and sued Google over the release of Android. Given that Google’s use of the
15 SSO was a legal and fair use, given that Google invested large amounts of money and employee
16 time in distributing Android, given that Google and other third parties built a thriving ecosystem
17 around the Android operating system, and given that Oracle/Sun itself praised and applauded
18 Android’s release for years after its initial release, Google did not adopt other substitutes for the
19 SSO simply because Oracle unfairly and unlawfully decided to attempt to reverse its position on
20 its previous support of Android after Android became a well-established, open source platform
21 used by many third parties.

22 Moreover, prior to Google’s public announcement and release of Android, Oracle/Sun
23 released (and continues to release) OpenJDK, which is a free and open source implementation of
24 the Java Platform, Standard Edition (Java SE) that contains (among other things) the SSO and is
25 made available under a free open source license, the GNU General Public License, version 2
26 (GPLv2), with the Classpath Exception. Pursuant to the GPLv2 with the Classpath Exception
27 license under which Sun/Oracle makes OpenJDK available, anyone, including Google, may copy,
28 modify, and distribute the SSO under the terms of the license for free. Accordingly, as will be

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1 discussed more fully during expert discovery, a non-infringing alternative available to Google
2 would have been to replace the allegedly-infringing SSO used by Google in Android with
3 licensed versions of the SSO incorporated from OpenJDK and distribute the licensed versions of
4 the SSO in Android pursuant to the terms of the GPLv2 with the Classpath Exception license. As
5 discussed more fully in the December 9, 2015 deposition of Anwar Ghuloum and Google’s
6 second supplemental response to Interrogatory No. 37, served on November 12, 2015, Google has
7 already begun to develop Android versions using OpenJDK. The source code for Android
8 versions using OpenJDK was made available for inspection pursuant to the parties stipulated
9 Protective Order on a secured, source computer at the offices of Keker & Van Nest LLP.

10 In addition, as discussed more fully in the revised Expert Report of Dr. Gregory K.
11 Leonard dated October 24, 2011, which Google hereby incorporates by reference in its entirety, a
12 non-infringing alternative available to Google would have been to use a programming language
13 other than the Java programming language, such as C++, Objective C, C, Python, Ruby,
14 JavaScript, etc., as an applications programming language for Android. Indeed, Apple’s iOS
15 platform has required and/or allowed developers to write their applications in Objective C, and
16 Apple is now transitioning to a new programming language called Swift. Google has allowed
17 developers to program applications for Android using applications programming languages other
18 than Java (e.g., C++) through the Android Native Development Kit (NDK). *See, e.g.*,
19 <http://developer.android.com/ndk/index.html>.

20 In support of the above contentions, Google reserves its right to rely upon, and hereby
21 incorporates by reference, all facts set forth in the previous trial record in this matter, including all
22 trial transcripts and trial exhibits, any deposition testimony and exhibits preceding the previous
23 trial, and any briefing, or exhibits identified in briefing, preceding the previous trial. Google
24 further reserves the right to amend or supplement its response to this Interrogatory based on
25 further information provided during fact and/or expert discovery in this matter, including but not
26 limited to supplementation after completion of any depositions that occur after the close of
27 discovery by court order and/or stipulation of the parties.

HIGHLY CONFIDENTIAL – ATTORNEYS’ EYES ONLY**INTERROGATORY NO. 40:**

To the extent YOU contend that YOUR use of any aspect of the 37 JAVA API PACKAGES constitutes fair use, state in detail the factual bases for that contention.

FIRST SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 40:

In addition to its General Objections, Google objects to this Interrogatory to the extent that it seeks information protected by the attorney-client privilege, the work product doctrine, and/or any other applicable privilege, immunity, or protection. Google further objects to this Interrogatory as vague, ambiguous and potentially overbroad and unduly burdensome and not proportional to the needs of the case as to the term “37 Java API Packages.” Google further objects to the extent that this Interrogatory prematurely seeks information that is the subject of expert opinion testimony prior to the dates set by the Court in this matter. Google further objects to this Interrogatory to the extent that it seeks discovery that should properly have been sought during the original trial of this matter.

Subject to and without waiving the foregoing objections and the above General Objections, Google states that its incorporation of the SSO of the 37 Java API Packages (and certain of the method headers reflecting that SSO) at issue in this lawsuit (hereafter collectively the “SSO”) was and continues to be an entirely legal and fair use. In support of this contention, Google reserves its right to rely upon, and hereby incorporates by reference, all facts set forth in the previous trial record in this matter, including all trial transcripts and trial exhibits, any deposition testimony and exhibits preceding the previous trial, and any briefing, or exhibits identified in briefing, preceding the previous trial. Google further incorporates by reference the entirety of its response to Interrogatory No. 11. Google further states that additional facts supporting this contention also include but are not limited to the following:

- Google’s use of the SSO was transformative in enabling a new and innovative smartphone platform, as even Oracle witnesses have testified to in deposition. *See, e.g.,* December 9, 2015 Deposition of Terrence Barr 134:11-138:16.
- Google’s use of the SSO was also transformative in that Google did not simply re-package or re-publish any copyrighted work. Rather, Google transformed the way

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1 the SSO may be used by expending tremendous resources writing the vast majority
2 of the source code for Android—including all of the implementation source
3 code—from scratch. Google put the SSO to a new purpose or use by creating a
4 modern, feature-rich smartphone platform that previously did not exist.

- 5 • Both before and after the launch of Android, Sun/Oracle recognized both in public
6 and private statements that Android was indeed a new and transformative
7 innovation and not a replacement or substitute for the Java SE platform. Sun’s
8 CEO, Jonathan Schwartz stated that Google had “strapp[ed] rockets” onto Java,
9 and other Sun/Oracle employees repeatedly applauded, commended,
10 complimented, and encouraged Google on Android.
- 11 • Sun/Oracle repeatedly tried, and failed, to create a successful smartphone platform
12 using Java. Google, by contrast, built Android into an innovative and successful
13 smartphone platform—something that Sun/Oracle could not accomplish—and then
14 made Android available to others for free under an open source license, fostering
15 rapid innovation, and further transforming the SSO of the Java APIs.
- 16 • Both before and after the release of Android, Sun/Oracle, as well as others in the
17 industry, believed that the SSO was free to be used by others, provided they
18 created their own implementing source code. Consistent with the custom and
19 practice of the industry, and these industry expectations in general, Google
20 likewise believed that that the SSO was free to be used, provided it created its own
21 implementation.
- 22 • Sun/Oracle was aware of, encouraged, and promoted open-source independent
23 implementations of the Java APIs, including but not limited to, independent
24 implementations created by Apache Harmony and GNU Classpath.
- 25 • Sun/Oracle and others in the industry (e.g., IBM) used code derived from
26 independent implementations, including but not limited to GNU Classpath and
27 Apache Harmony, in commercial products. Sun/Oracle was obviously aware of its
28 own use of such code and it openly acknowledged and promoted others’ use of

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such code, including, but not limited to, at Sun/Oracle’s own JavaOne conference.

- The Java APIs, and thereby the SSO, are functional works, as they are essential building blocks for using the free Java programming language and are necessary to achieving interoperability. They are a functional command structure.
- The Java APIs are inseparable from, connected to, and/or dependent on the free Java programming language, and therefore a reasonable copyright owner would believe that Sun/Oracle had consented, and Sun/Oracle in fact did consent, to use of the Java APIs by others, including but not limited to Apache Harmony, GNU Classpath, and IBM.
- Sun/Oracle intentionally promoted the use of the Java APIs, and thereby the SSO, in schools, textbooks, etc. as part-and-parcel with learning the Java language itself, because Sun/Oracle wanted to broaden the universe of people who used the free Java language and associated APIs.
- Oracle’s 30(b)(6) witnesses have conceded in deposition testimony that the Java APIs, and thereby the SSO, are an inseparable part of the Java programming language, which is open and free for anyone to use. Oracle witnesses have also testified that the Java APIs are connected to and dependent upon the Java programming language.
- As discussed more fully in the Opening Expert Report of Dr. Owen Astrachan dated July 29, 2011, many aspects of the SSO are themselves borrowed, derived, or re-implemented, from programming languages and standards that preceded the Java programming language, including (among other things) the method declarations in the <math.h> and <stdlib.h> libraries of the C/C++ programming languages, the syntax and semantics of regular expressions in the Perl programming language, the class hierarchy and various class names of the Smalltalk programming language, the naming conventions of POSIX socket standards, the syntax and semantics of the POSIX printf() standard, and the method declarations in the <ctype.h> library of the C/C++ programming

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languages.

- Prior to Oracle’s purchase of Sun, Sun/Oracle considered it fair and proper for another company to create an independent implementation of the SSO without a license from Sun, so long as the resulting product was not called “Java.”
- Prior to Oracle’s purchase of Sun, Sun/Oracle was aware of several unlicensed implementations of the SSO and, in fact, encouraged these independent implementations.
- Google’s use of the SSO was also a fair use because the purpose of Google’s use of the SSO was to achieve interoperability. Google chose to use the specific SSO of 37 Java API packages, out of the 166 total API packages in the Java SE platform, because those were the API packages that developers would expect to be present in a smartphone. Use of the free and open Java language requires at least some portion of the SSO, and other portions of the SSO are critical to make any meaningful use of the language and/or meet industry expectations.
- As discussed more fully in the Opening Expert Report of Dr. Owen Astrachan dated July 29, 2011, the SSO constitutes only a small part of the Java APIs and Google used only the portions of the Java APIs that were necessary for mobile applications. In particular, the SSO reflects only 37 of the 166 Java API packages in the asserted copyrighted works, and the SSO represents only a tiny percentage of the Android Core Libraries and the Android Platform.
- At most, Google’s use of the SSO is only indirectly commercial. Google provides advertising on smartphones and other devices running Android—as well as on smartphones and other devices not running Android (e.g., iOS devices)—but the SSO does not directly enable advertising or directly drive revenue to Google. Google generates advertising revenue from the use of devices running Android and other smartphone platforms, because of Google-owned and developed advertising-related technology that has nothing to do with the SSO.
- Since Google’s release of Android, Sun/Oracle has publicly acknowledged that

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1 Android has helped increase the popularity of the Java language and benefitted the
2 Java community as a whole. It was and always has been a part of Sun/Oracle’s
3 business strategy to popularize the Java language and the Java APIs, so that the
4 base of individuals and products using the Java language was broader. Indeed,
5 Sun’s CEO indicated that Google strapp[ed] rockets onto Java, and Terrence Barr,
6 a Java Evangelist at Sun and current Oracle employee, declared that Android
7 would benefit the Java programing language and the Java platform by “literally
8 guarantee[ing] Java remains the dominant platform for years to come.”

- 9 • Furthermore, Sun/Oracle has benefited from Android by building or attempting to
10 build technology to work with, compliment, run on, or be accessed through
11 Android-based devices, including but not limited to applications that allow access
12 to Oracle sites and products, Java FX, Oracle Mobile Application Framework,
13 Application Development Framework, and plans to port Java to Android.
- 14 • Google’s use of the SSO in Android did not harm the market for licensing the
15 SSO. Prior to Oracle’s purchase of Sun, Sun/Oracle Sun’s licensing practices did
16 not preclude Google from using the SSO in Android. To the contrary,
17 Sun/Oracle’s business model was to promote widespread and free use of the Java
18 language and the associated APIs (including the SSO) and to compete on
19 implementations for those APIs (including the implementations of the 37 API
20 packages).
- 21 • Google’s use of the SSO in Android also did not harm the market for the SSO by
22 fragmenting the Java SE platform, because by the time Android was released,
23 Sun/Oracle had already fragmented the Java SE platform itself by creating separate
24 versions of Java. In addition, by the time Android was released, Sun/Oracle had
25 already enabled the fragmentation of the Java SE platform by giving away the SSO
26 for free, and without any restrictions on fragmentation, through OpenJDK and the
27 associated GPLv.2 with the Classpath Exception open source license, which does
28 not require compatibility. Sun/Oracle’s other Java platforms (e.g., Java ME) were

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1 fragmented before Android, as Oracle witnesses testified to in deposition. And
2 Oracle has announced plans to further fragment or “modularize” Java, including
3 but not limited to “Project Jigsaw.”

- 4 • Sun/Oracle could not compete in the actual or potential market for mobile phones
5 because it failed to innovate and/or evolve the Java platform quickly enough to
6 keep up with rising demand for modern, feature rich smartphones with compelling
7 user interfaces. Sun/Oracle decreased investment in its Java mobile offerings,
8 abandoned efforts to build a mobile phone, and chose not to pursue other potential
9 market opportunities. Therefore, any market harm that Oracle has suffered is a
10 result of Sun/Oracle’s own doing, and is not attributable to Google’s use of the
11 SSO in Android.
- 12 • Android did not displace or supersede Java in the market, because Oracle did not
13 have a product that could actually compete in any market with Android. Because
14 Android is a full-stack smartphone operating system, it is very different from (and
15 superior to) Java SE and any other mobile Java product that Oracle has offered or
16 intends to offer.
- 17 • There is no evidence that any “market harm” or lost business opportunity of
18 Oracle’s is due to Android’s use of the SSO. Any such harm is due to the flaws in
19 Oracle’s own products or strategy and/or the many desirable attributes of Android
20 that have nothing to do with the SSO. Indeed, Oracle witnesses have described
21 Oracle’s Java strategy as “screwed up” or “failing,” admitted that Java had
22 significant technical and business problems, and admitted that they were impressed
23 with Android and that Android was (in some respects) superior to Java.
- 24 • Oracle’s 30(b)(6) witnesses have conceded that Android does not compete with
25 Java in many markets, and that they are not able to identify any instances where
26 Oracle lost a specific customer or business opportunity that it would have secured
27 absent Android’s use of the SSO.

28 Google further states that Google’s fair use is also evidenced by documents produced in

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1 this matter, including without limitation: GOOG-00000001-GOOG-00022378; GOOG-
 2 00022389- GOOG-00103811; GOOG-00103817- GOOG-00542335; IBM000001 - IBM000039;
 3 GOOG-10001898- GOOG-10002177 and GOOG-10002472-GOOG-10002515. Google reserves
 4 the right to amend or supplement its response to this Interrogatory based on further information
 5 provided during fact and/or expert discovery in this matter, including but not limited to
 6 supplementation after completion of any depositions that occur after the close of discovery by
 7 court order and/or stipulation of the parties. Google further incorporates the deposition testimony
 8 of Terrence Barr, Donald Smith, and Mike Ringhofer. Google further incorporates by reference
 9 its response to Interrogatory 30. Google reserves its right to rely upon, and hereby incorporates
 10 by reference, all facts set forth in the previous trial record in this matter, including all trial
 11 transcripts and trial exhibits, any deposition testimony and exhibits preceding the previous trial,
 12 and any briefing, or exhibits identified in briefing, preceding the previous trial. Google further
 13 reserves the right to amend or supplement its response to this Interrogatory based on further
 14 information provided during fact and/or expert discovery in this matter, including but not limited
 15 to supplementation after completion of any depositions that occur after the close of discovery by
 16 court order and/or stipulation of the parties.

INTERROGATORY NO. 41:

19 To the extent YOU contend that ANDROID has had and will have no effect upon any
 20 actual or potential market for exploitation of any version of the Java Platform, state in detail the
 21 factual basis for that contention.

FIRST SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 41:

23 In addition to its General Objections, Google objects to this Interrogatory as vague and
 24 ambiguous due to its use of the terms “Android,” “effect,” “exploitation,” and “Java Platform.”
 25 Google further objects to this Interrogatory as unduly burdensome or seeking information not
 26 proportional to the needs of the case in failing to constrain the scope of the Interrogatory to
 27 material at issue in this lawsuit. Google objects to this Interrogatory to the extent it seeks
 28 information protected by the attorney-client privilege, the work product doctrine, and/or any other

HIGHLY CONFIDENTIAL – ATTORNEYS’ EYES ONLY**INTERROGATORY NO. 42:**

To the extent YOU contend that YOU are entitled to an express or implied license defense because YOUR use of any aspect of the 37 JAVA API PACKAGES is covered by any license expressly authorized by Sun or Oracle, or because YOUR use of any aspect of the 37 JAVA API PACKAGES was, is, or should be considered authorized under the circumstances despite the lack of such a license, state in detail the factual basis for that contention.

FIRST SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 42:

In addition to its General Objections, Google objects to this Interrogatory to the extent it seeks information protected by the attorney-client privilege, the work product doctrine, and/or any other applicable privilege, immunity, or protection. Google further objects to this Interrogatory as vague, ambiguous, nonsensical and overbroad due to its use of the terms “any aspect of the 37 JAVA API PACKAGES,” and “was, is or should be authorized under the circumstances.” Google further objects to this Interrogatory to the extent it purports to request information unrelated to Android and the allegedly infringed material at issue in this lawsuit. Google further objects to this Interrogatory as improperly compound and containing multiple distinct sub-parts. Google further objects to this Interrogatory as unduly burdensome and not proportional to the needs of the case to the extent it requests information, documents, and/or things not within the possession, custody, or control of Google. Google also objects to this Interrogatory as overly broad, unduly burdensome, not relevant to any claim or defense in this lawsuit, and not proportional to the needs of the case to the extent that it seeks information related to operations of Google outside of the United States having no connection with the United States, and to the extent that it seeks information unrelated to the copyright infringement allegations set forth in Plaintiff’s Amended and Supplemental Complaints.

Subject to and without waiving the foregoing objections and the General Objections, Google states that, with respect to this Interrogatory’s query concerning the license defenses, the Court dismissed Google’s defense of implied license in its May 31, 2012 order. Google further states that it does not assert the defense of express license as to any of the already-released versions of Android. Google reserves its right to rely upon, and hereby incorporates by reference,

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all facts set forth in the previous trial record in this matter, including all trial transcripts and trial exhibits, any deposition testimony and exhibits preceding the previous trial, and any briefing, or exhibits identified in briefing, preceding the previous trial. Google further reserves the right to amend or supplement its response to this Interrogatory based on further information provided during fact and/or expert discovery in this matter, including but not limited to supplementation after completion of any depositions that occur after the close of discovery by court order and/or stipulation of the parties. Google further reserves the right to amend or supplement its response to this Interrogatory based on further information provided during fact and/or expert discovery in this matter, including but not limited to supplementation after completion of any depositions that occur after the close of discovery by court order and/or stipulation of the parties.

INTERROGATORY NO. 43:

To the extent YOU contend YOU incurred any expenses or costs associated with YOUR revenues derived directly or indirectly from exploitation of ANDROID (including, without limitation, from licensing and distribution of ANDROID, licensing and distribution of the Android-compatible applications sold through the Google Play store or any digital content sold through the Google Play store, and all mobile search advertising revenue earned by Google in connection with the actual or potential use of any ANDROID device), identify all such expenses or costs and explain in detail how they are causally related to the revenue produced.

FIRST SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 43:

In addition to its General Objections, Google objects to this Interrogatory as vague and ambiguous as to the use of the phrases “exploitation of ANDROID” and “actual or potential use of any ANDROID device.” Google further objects to the Interrogatory to the extent it implies that Android generates direct revenues; Android is an open source operating system offered for free. Google further objects to this Interrogatory as prematurely seeking expert opinion testimony and discovery prior to the dates set by the Court in this matter. Google also objects to this Interrogatory as overly broad, unduly burdensome, not relevant to any claim or defense in this lawsuit, and not proportional to the needs of the case to the extent that it seeks information related